Watson On Leasing
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COMPUTERWORLD
The Newsweekly for the Computer Community

Weekly Newspaper – Second-class postage paid at Boston, Mass.

360/85 Pictured
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New Cobol Flowchart Nearly Ready For 360 – Fewer Pages Used

PRINCETON, N.J. -- A new automatic flow-charter from National Computer Analysts, Inc. will soon be available to customers running 360 installations. Flow-charters are already available for RCA 301, 3301, and Spectra/70 systems, and the technical team has just completed the debugging on a 32k 360 system in Miami, Fla.

Quick Draw's output has some significant differences from other automatically produced flow charts. These changes are primarily in the number of columns used on the page, and the amount of data included in each of the boxes. Both of these, and a number of other innovations are aimed at reducing the number of pages of flowchart produced by a given program.

Cobol-Centered

The main source-language aimed at is Cobol, although there will also be Fortran and Assembler versions. These will be available only as add-on features to a Cobol system, costing $5,700 to lease for 3 years.

Brooks Doubts PL/1 – Says Billions Are Being Risked

WASHINGTON, D.C.-- Congressman Jack Brooks picked out a new EDP problem area recently. Partially abandoning his previous emphasis on standards and compatibility, he zeroed in on programming languages as being the central danger to EDP efficiency. In a letter to the Bureau of the Budget he asked for urgent action to safeguard billions of dollars.

PL/1, the new programming language sponsored by IBM, was cited as being a particular danger.

Congressman Brooks was expressing a concern which a number of other people and organizations, acting quite independently, were beginning to express. The concern is over the unknown level of IBM's support of Cobol and Fortran, the present most popular programming languages, in contrast to its announced intention to fully support PL/1.

For instance, E.B. Matthews of Saunders Associates went through a conversion in 1967 and said that they must "never again, knowingly program themselves into a corner." Pointing out that PL/1 is not compatible, and that it does not show any signs of ever being compatible, he has called on IBM to support his present language, Cobol.

Excerpts from Congressman Brooks' letter appear on page 2.

The same lack of PL/1 language compatibility also aroused Bork K. Lee, Guide Eastern Region Cobol chairman. After talking to some sixty-eight colleagues who were using Cobol, he asked IBM why it was just beginning to study the possible translation of Cobol to PL/1. PL/1 was announced four years ago, when Cobol was already the industry standard.

The Governor of Virginia activated a task-force to see if Cobol and Fortran should become standard languages in an effort to save money.

His Computer Advisory Committee, as was reported in COMPUTERWORLD last week, recommended this measure -- but in their detailed report did not even bring PL/1 up for consideration.

From the tone of his letter, Congressman Brooks was not having much luck in finding possible solutions. He specifically mentioned the National Bureau of Standards, the USA Standards Institute, user groups, and manufacturers as possible contenders for the job of defining the problem, and finding solutions. Having named them, he dismissed them all as being unsuitable, saying that some less involved body was needed. One possibility is the National Academy of Science.

In the meantime, IBM stayed mum, declining to amplify or extend the official statement on its programming language policies presented last August at the Miami Share meeting. (CW Vol. 1, No. 3)

Tape Prices Slashed 40% As Govt. Buys In Bulk

The Ampex Corp. snagged a large government contract last week. They have contracted to supply up to 600,000 reels of magnetic tape at $12 to $14 per reel; a price reduction of 40% compared with previous government tape purchases. Government sources are reported to be very pleased with the success of their new centralized purchasing system, an offshoot of the Brooks Bill. (Through the Brooks Bill, a central agency has been established to rationalize the spending of government monies for computers.)

Bulk Orders for Tape

The actual savings will not be known for some time, as it depends on the number of reels that various agencies use through the year.

The difference between the present contract and previous ones is that the government is handling all the bulk tape needs for most gov't orders that do not individually amount to more than $50,000 in value. Requirements that exceed $50,000 will still go out for competitive bids.

Previously, the government has paid approximately $23 per reel, and with the increased quality assurance program these costs might have gone even higher. The GSA thought, however, that price reductions resulting from the new purchasing method would approximate those which Ampex offered.

3M Corp. Awarded Contract

Ampex, one of the original independent tape suppliers, is also one of the few manufacturers who do not sell under a number of different brand names. Most other computer tapes currently being made are often sold directly to wholesalers for repackaging.

At the same time that Ampex was awarded this 12-month contract, another was given to the 3M Corp. 3M will supply up to 80,000 reels of tape during the same period.

The success of this procurement style will probably increase GSA's attempts to cut EDP costs. The next target may well be the possible use of plug-for-plug compatible peripherals, currently under discussion.

Major Announcements

'Keytape' & H-110 Shown

NEW YORK -- Honeywell has added two products to its line: Keytape data preparation devices and a small-scale computer, the Model 110.

C.W. Spangle, vice president and general manager of Honeywell's Electronic Data Processing Division, said here that the new products are aimed at two distinct markets: the Keytape devices at the huge data preparation market, which is dominated by keypunch machines; the Model 110 largely at the market for first-time computer users.

The Model 110, renting for an average $2,500 a month, becomes the smallest of nine compatible central processors now in the firm's Series 200 computer family, Spangle said. It is being offered as a "complete data processing package," with software, applications aids, customer training, and other support features tailored to users of punched card or manual information processing equipment and to users of very small competitive equipment.

Keytape

The Keytape data preparation devices look like small magnetic tape drives with attached keyboards. By transcribing information from original documents directly onto magnetic tape – doing away with the normal intermediary step of preparing punched cards on conventional keypunch machines – the new devices are said to reduce data preparation time by 25 to 30%.

The Honeywell Keytape devices are aimed at the very large off-line data preparation market, said to comprise from 350,000 to 500,000 punched card, punched paper tape, and keyboard-to-magnetic tape machines throughout the country. About 80 to 90% of all original data entered into a computer system is now prepared on punched cards. Keytape units can reduce this punched card input to as little as 15% in many installations, according to Spangle.

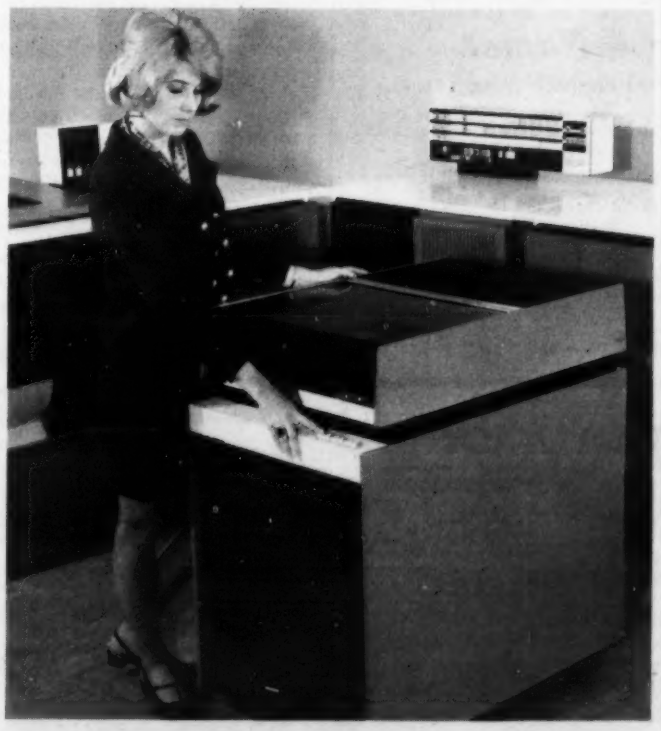
"Initial field tests of Keytape units," Spangle said, "show that the operator turnover rate is lower than with keypunches, operator training is faster and less costly, and operators feel closer to the computer. Data entry, verification, error detection, and error correction are also less complicated and less costly than with existing off-line data preparation machines."

A Complete Package

Honeywell's marketing approach with the new Model 110 is to offer to the first-time user a "total system" that includes hardware, operating software, five general accounting application programs, operator training courses, and a workshop to help customers develop expertise in advanced applications.

Spangle said, "The complete package is an easy way for a small business to enter electronic data processing for the first time or for users of tabulating equipment to convert to a full computer system at very little additional monthly cost."

Technical details of the Keytape data preparation devices appear on page 5.



A view of the new small scale Honeywell computer, the 110. A Cobol programming system is provided for tape systems at the 8k level and for disk systems (like the one shown) at the 12k level.

Editorials

Caesar's Wife

Handling a man's data is almost as dangerous as handling a man's wife. It doesn't really matter whether the relationship is abused or not. If the situation is there people will worry. And so, it was very reasonable that when rumors spread through New York about common ownership of a large data processing firm specializing in advertising accounts, and one of the large Madison Avenue agencies, clients began to worry. Repeated denials by the president of the DP firm were believed, but the rumor persisted.

It turns out that the denials were absolutely accurate... that is to say, they were legally accurate. John Felix Associates was not owned by the McCann-Erickson agency. They were both owned by Interpublic.

These denials should never have been made. Whether or not they were legally accurate; whether or not any abuse ever occurred; people whose trade is in the handling of information should realize that, like Caesar's wife, no shadow of distrust should fall upon their word. Mealy-mouthed "accuracy" such as this is tantamount to asking for serious trouble.

Clearing Vistas

Mrs Phyllis Huggins is the gad-fly of the computer industry who puts out a rather outspoken newsletter. Her current letter hands out prizes for various 1967 "Most Importants." The Most Important Story -- Phase II upset; Most Serious Development – The FCC Problem; etc.

Only one award was not given – The Most Significant Technological Achievement. She could not find anything worthwhile, commenting that this would give other countries the opportunity to catch up with the USA.

While sympathetic to her, COMPUTERWORLD feels that she was wrong – ironically wrong.

The Most Significant Technological Achievement of 1967 was that ordinary users began to see through so-called "Significant Technological Achievements." Just as Mrs Huggins did when she did not make the award.

What's In a Name?

The announcement of the Honeywell keytape facility has a number of important facets. One of them is the name itself – "Keytape."

The concept of a keyboard operator working and recording directly with data recorders is becoming well known, but the process has not been officially named. The verb form "to data record" seems unusable; while "Keytape" makes the proper contrast with "Keypunch."

We welcome the new name.

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The Newsweekly for the Computer Community
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Present EDP Bodies Bypassed!

The Brooks Letter On Languages

Congressman Jack Brooks suggests in his letter that billions of EDP dollars are at stake, and that our present ideas of safeguarding our position through standardization is not merely unproved, but may well be completely erroneous. COMPUTERWORLD feels that the congressman's opinions are of importance to the whole data processing community, and hopes that they will initiate a serious discussion in the community centering around the problems before us.

December 5, 1967

The Honorable Charles L. Schultze
Director, Bureau of the Budget
Washington, D.C. 20503

Dear Charlie:

The Subcommittee is proceeding with the evaluation of the hearings on Government management of data processing held in July. Because of the complexity of the matters under consideration, a further period will be required to prepare the Subcommittee's report. Meanwhile, certain facets of data processing usage merit immediate attention, not only by appropriate officials of the Government, other large users, but by the data processing manufacturing industry as well.

Need Problem Definition

1. There is a need for specific problem definition in the data processing standardization effort.

We have assumed without sufficient basis that "standardization" – whatever this term may mean – is an overall solution to this entire problem area, although this approach might be either difficult, impossible, or outweighed by some more acceptable, more practical solution.

It follows then that our efforts to increase data processing effectiveness and efficiency require:

a) Appraisal of the entire computer environment to identify as best we can those aspects of computer systems where variances in design or usage compromise utilization;

b) defining as specifically as possible the ultimate objective sought to remedy these specific problems;

c) defining the term "standardization" as this concept may apply to these varying problems;

d) inclusion within the standardization concept of some practical means of evaluating the need for and the economic value of software and hardware development that would alter previously adopted standards or affect data processing compatibility;

e) determining whether "standardization" is essential, simply desirable, or undesirable as a means of solution, and considering possible alternative courses as a more practical means to achieve the objective sought.

Alter Standardization

2. The standardization effort must be altered to optimize results.

Whatever, the cause the standardization effort is "cresting" too late to meet demand. The delays are unacceptable no matter how understandable their causes may be.

A critical reevaluation of the entire standardization effort must be made to invigorate and speed up the process so that the effort can be as effective as possible in the solution of those problems that can be properly and practically dealt with through standardization.

Develop New Criteria

3. Independent criteria identifying the characteristics of a new generation common computer language must be developed.

IBM has announced PL/1 will receive primary support in future company software development – Cobol and Fortran only to the extent necessary to maintain industry-accepted standards. There is considerable sentiment among those well-versed in Cobol and Fortran and not in the employ of IBM that there is little value in PL/1. IBM claims the need for a machine-independent language that will also lessen the demand for programmers. To those uninitiated into the complexities of Cobol data handling, PL/1 has a definite charm in its relative simplicity despite the fact that, at least at present, there may be no advantage in compiling and operating time – the basic measures of language efficiency.

Compatibility Problems Hidden During Initial Usage

Because of IBM's dominant position and the fact that new users most likely will accept the apparent advantages of PL/1 (compatibility and standardization problems normally are not as apparent in the initial stages of data processing usage), it is reasonably predictable that in the absence of any forceful, affirmative effort, PL/1 could, by default, become the *de facto* language of the next generation even though it may be less than the best.

No Criteria Available For Standardization Effort

USASI has undertaken a pre-standardization effort regarding PL/1. But, such efforts are premature for there are no general independent criteria reflecting user requirements and computer capabilities within the "state-of-the-art" to use as a measure in evaluating the acceptability of this as a new generation language.

"PL/1 Review Sought"

Comparisons with Cobol and Fortran are not sufficient. Although advantages may be shown, these may not be of a nature or degree sufficient to qualify PL/1 as the next generation language. Furthermore, to the extent that any language can be machine-independent, this quality in PL/1 remains to be proved. Other preliminary questions must be answered; for example, the existence of effective alternatives to standardization, whether the next common language (assuming the applicability of the standardization concept) should and can be of a higher order of standard Cobol and Fortran, or whether optimum user benefit requires adoption of a fundamental new approach to language development.

Assuming the validity of applying the standardization concept to computer languages and following development of general criteria necessary or desirable in a new generation language, then a truly effective and meaningful evaluation could be made of PL/1 as well as any other proposed language or combinations thereof. Under these circumstances, it would then be reasonable to expect IBM, under improved USASI procedures, to adopt changes in PL/1 (including the name of the language) deemed necessary to meet the general criteria. Also, other manufacturers, as well as principal user groups, could be expected to either participate in this standardization effort or accept whatever conclusions that may be reached.

It is unlikely that development of language criteria can take place within the structure of USASI, the National Bureau of Standards, or any of the manufacturer or user oriented organizations. For optimum results, a more detached approach would probably be the best. Second, the effort should attract the best minds in the entire data processing community. All of the key people that are needed are not included in the membership of these organizations. For this reason, the Executive Branch should determine the feasibility of establishing a quasi-formal working group or, in the alternative, solicit the interest of some organization such as the National Academy of Sciences to participate in the identification of new generation language criteria.

Push Software Inventory

4. The Bureau of the Budget must push completion of the Federal Government's software inventory.

A comprehensive inventory of Government-owned software is essential in making any meaningful evaluation in this (software) area.

In addition, an inventory of Government software is needed as a data base for Federal Government policies relating to the procurement of next generation languages. Economically, it may well be that despite the availability of a more effective, modern language, numerous applications in the Government would for years be best served through maintenance of older generation languages.

Billions At Stake

In varying degrees, work is under way on many aspects of these problems. In some areas, however, little if anything is being done. Our purpose is to emphasize and invigorate these efforts in a more orderly manner. Literally billions in capital investment and in operational efficiency are at stake. And, we must do the very best we can to provide for optimum data processing usage, not only in the Federal Government, but throughout the national economy. In July, 1966, the President stated the problem in these words:

"Computers will enable us to achieve progress and benefits which a decade ago were beyond our grasp. The technology is available. Its potential for good has been amply demonstrated, but it remains to be tapped in fuller measure."

Unyielding Support Of Congress

This effort towards optimum utilization of data processing has the strong unyielding support of the President and the mandate of Congress. We believe it merits the support of the entire community.

Sincerely,
Jack Brooks, Chairman
Government Activities
Subcommittee of the Committee on Government
Operations,
House of Representatives,
Rayburn House Office Bldg.
Rm. B350-B
Washington, D.C. 205[illegible]

CACM Story Implies Urgent Need For ACM Lobby In Washington

NEW YORK – The ACM was urged – indirectly – to go into the lobbying business by their Washington editor, Jim Titus, in an article which appears in the current Communications. The article first paints a general background showing the respectability of lobbying, and the ability of even small groups to lobby effectively. It then deals with the operations of an existing lobby (EDUCOM – the Interuniversity Communications Council) and the potential future lobbies of peripheral manufacturers and software houses, contrasting their active operations with the reluctance of the ACM to testify before Congress.

Reaction To Article

Informed reaction to the article concentrated on what was not said, rather than what was said. EDUCOM's staff relocation to the political capital of Washington was contrasted to the (unmentioned) fact that ACM headquarters are just off Madison Avenue, the advertising capital of the country. EDUCOM's stated objective of having an authoritative voice was contrasted with the lack of any such ACM objective. The discussion of various lobby sizes is being interpreted as kite-flying for a possible compromise solution – that of allowing ACM headquarters to remain in New York with the formation of a small Washington based lobby.

Support Offered By New Software Broker On Eastern Seaboard

An eastern firm, based in Philadelphia, has joined the ranks of software brokers. Atlantic Software, Inc. intends to represent companies or individuals who have developed computer programs with potential market value.

Three Specific Services

Atlantic Software will offer three specific services: national advertising; insertion of the program in the Atlantic Software program library; and technical support from its data systems services division to tailor the software package to buyers' specific requirements.

They will operate on a commission basis for each sale actually made, reducing the amount of investment needed by the original program owner.

If a particular software package is needed and not known to be available, Atlantic will send the requirements to people who may have such programs. This means that they will operate like a spare parts dealer for used cars. A dealer, when approached for a part he does not have, will contact other potential suppliers.

Software Innovation

Support of programs by software brokers seems to be an innovation. Robert Head, president of Software Resources, told COMPUTERWORLD that in his operation, support is given by the program originator, and that his company does not intend to get involved in this type of operation. Software Resources is a recently formed and well publicized software broker on the west coast.

W.U. Sued By Its First EDP Customer — For $37 Million!

A lawsuit against Western Union, asking for $37,000,000 for failure to provide contracted computer services and programming, has been filed by Law Research Service, Inc., New York.

Mr Hoppenfeld, president of Law Research, told COMPUTERWORLD that he felt Western Union simply did not have the capability to do the job they were supposed to do. Hoppenfeld explained that LRS had a written agreement with Western Union, and had suffered extensive damages as a result of Western Union not providing the promised services.

He pointed out that there were 30 states to be put on the system, and that Law Research Service had filed what were, in effect, franchises to agents in these states. These agents, called "directors," were, he said, "being wonderful," but they had been very embarrassed. Legal circles reported that some of these franchises were considering the possibility of suing LRS, if they were not already doing so. Hoppenfeld, when asked about this, did not answer directly but said that the agents were naturally concerned, and that a number of them would appear during the hearings.

LRS provides legal citation services through the Western Union Teleprinter network. "Western Union Legal Citation Service," is available in certain states, including Florida and Missouri, but was to be made available to many other states last summer. The damages being claimed are for the direct loss of sales and business reputation.

Western Union's legal counsel feels that the Law Research Service suit contains erroneous and extravagant claims for damages, and that Western Union's liability, if any, would be minimal.

In the meantime, LRS is proceeding with business and is considering expansion to the United Kingdom.

Small EDP Firms Helped

Software Financing Available — Premium Asked

Financing for the intangible value of software as well as for hardware solid values has become available through a new firm, Data International, Inc., of Minneapolis. They have had no actual experience in financing software, but are currently working on proposals totaling more than $1,000,000, according to president Dr. John H. Doede. The firm will offer financial support for software to get a computer system into operation – allowing small computer firms to economically provide software for some of their bigger customers.

Dr. Doede told COMPUTERWORLD that his operation would be similar in many respects to the building of a house under a bank mortgage system. Data International expects both the buyer of the hardware and the potential supplier of the software to bring them software specifications defining what is to be done and how it would operate. They will make advances during the creation of the software but will not pay for it until acceptance tests have been passed. The specifications will be tighter, Dr. Doede said, than those currently in use through the industry.

The new firm is the first to offer financing for such "intangibles." The interest rates are somewhat higher than for hardware, but it does allow the cost of software to be amortized over the useful lifetime of a computer.

Dr. Doede has been in the industry for ten years working with the Argonne National Laboratory and other computer operations.

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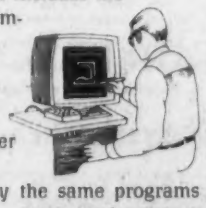

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Share DOS Project

DOS Users' Requests To IBM

During the past four months the Share DOS/TOS Project has been working with IBM to define changes needed by users. The project defined the changes which they wanted, and presented them to the corporation. When the company responded it was found that 12 of the 13 requests had been turned down – and the other was not accepted – but simply "under consideration."

COMPUTERWORLD believes that many people will be interested in seeing just what changes were requested, and why IBM turned them down. Here are some of the requests – others were published last week.

DOS Committee Request – Job Control Options:

Consistent and correct interpretation of the LINK, DECK, and NODECK options are necessary as follows: DECK – Punch an object deck; LINK – Perform the linkage edit function; NODECK – Suppress punching of object deck; LINK, DECK – Punch deck and perform link function; LINK, NODECK – Perform link function, suppress punching of deck; CATAL, DECK – Perform link function, cataloging and punch deck; etc.

It is impossible to successfully use LINK and DECK options concurrently in all processors except PL/1.

The Fortran processor ignores the NODECK option.

If PL/1 does not compile successfully the LINK option bit in the Job Control, switches of the Supervisor Communication Region is turned off. This is not the case with any other processor.

IBM Response: *We recognize that this is not a control program problem but is a compiler problem and should be addressed to each of the language committees.*

DOS Committee Request – 1442 Support:

It is required that DOS support of the 1442 be improved. Specifically:

IBM-supplied programs which punch cards should read the cards first to insure that they are blank, and if not, issue an appropriate operator intervention message.

IBM-supplied modules which punch cards that may not have information all the way out to column 80 (for example, CDMOD and OUTCARD) should determine the last column to be punched, and set the count in the CCW accordingly.

On DTFCD, TYPEFLE = COMBND and RECFORM = UNDEF should be supported.

It is very easy for a programmer or operator to forget to put in any blank cards, or to put in an insufficient number, or to put them in the wrong place. The result in any of these cases is that his object deck, or other output, is punched on top of the next stacked job. This is a very undesirable situation.

Since the speed of punching is strongly dependent on the number of columns punched, only the necessary number should be punched. That is, don't waste time punching blanks.

Because users sometimes wish to punch cards which are already punched, a blanket check cannot be made on user output. However, it would be very convenient if the user could specify, either by a parameter in the DTF (and some corresponding methods in Cobol and Fortran, etc.), or by a job control card, whether or not repunching was to be allowed. If it was not allowed, then the system should handle it in the same way as for compiler output.

IBM Response: *The current 1442 support has been found adequate for most users. Because of limited usage of the 1442 with DOS, extension of the support cannot be justified.*

DOS Committee Request – Additional Core-Image Libraries:

The necessity of additional core-image library (CIL) space has become vital to most DOS users. It is required that one or more additional CIL's be provided, the number of which to be specified at system generation time.

One CIL has proven inadequate to most installations using DOS who wish to catalog their programs. The situation is worsened when additions are made to the system by the implementers (e.g. six processors now including the Assembler, Fortran, Cobol, PL/1, RPG, GPSS, etc., requiring in turn additional space in the Relocatable and Source Statement Libraries) thus reducing the user's available space in each library.

Besides the advantage of more CIL space, additional CIL's facilitate system generation time when it is realized that these additional libraries remain untouched although a new main CIL has been generated or created.

IBM Response: *This item is presently not in our plan but it is being evaluated as to its technical feasibility.*

DOS Committee Report – Cataloging of Job Control Procedures:

While it is possible to catalog an object module it is recognized that this is only part of a complete program which in its entirety is required to be cataloged and will include all job control steps between the "//JOB" card and the "/&" card.

Most users in a production environment require several job steps in the completion of one production run (i.e. several execute cards, VOL, DLAB, and XTENT CARDS, etc., etc.). All of these cards must be filed away thus incorporating bulky handling procedures.

The handling of a production run in a teleprocessing environment is likewise an impossible situation. When label information is required for a real time file, for example, a truck dispatching environment is completely frustrated by the fact that no method is provided to obtain that file information on an object time basis.

IBM Response: *We do not recognize this as a major requirement for the DOS system although it is technically feasible to implement such an improvement. We have no plans at the present time, either formally or informally, to implement this feature. We feel with the improved tape and disk label cataloging facilities available with Version III this requirement becomes less important.*

DOS Committee Request – Buffered SYSLOG:

It is required that all output to SYSLOG be buffered or that all system use of SYSLOG be consistent in not inhibiting other partitions such as teleprocessing.

During receipt or transmission of teleprocessing data it is possible that this can be inhibited for up to about eight seconds during system use of SYSLOG. For example, if some other device is made un-ready and another partition references that device then DOS places a message on SYSLOG. During the output of this message all TP polling is inhibited resulting in loss of data at the terminal (for example, in a process control environment).

IBM Response: *We are giving active consideration to providing a console overlap feature as an improvement to the DOS system. We are not prepared to make a commitment at this time.*

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Communitype Corp To Park Ave.

NEW YORK - *Communitype Corp.*, manufacturer of electronic data communication terminal equipment, has leased nearly 2,500 square feet of floor space in the new General Motors Building under construction in Manhattan. Company headquarters will move to the new building after its completion in the spring.

NEWTON, PA. - *Optical Scanning Corp.* expanded its sales force by naming five new account managers. They are: John Albers, for southern California and Arizona; Thomas Boyle, for Manhattan south of 14th Street; Lloyd E. Browning, for Michigan, Canada and northwestern Ohio; Robert N. Gillespie, for western New York; and Robert L. Woodward, Jr. for northern California, Oregon, Washington, Idaho, Montana, Wyoming, Colorado, Nevada, and Utah.

NEW YORK - *Farrington Manufacturing Co.* has established a Domestic Marketing Division. Named as vice presidents in the new division are R. A. Donohoe, D. E. Sailer, William Rein, Jr., and V. E. Wentworth.

Expansions

Operator Instructions Shine

Two-Tape Reels Used On New Keytape Units

The new Honeywell Keytape family has 3 major units. These are the basic keyboard Keytape system; a Keytape communicator, that allows for the transmission of data to and from remote sites by means of voice-grade telephone wires; and a Keytape pooling system where tapes can be merged. All units use some fixed block lengths between 80 and 120 characters, and specific versions are available for 9-channel work. In addition to Honeywell equipment, IBM 360, Control Data, NCR, Burroughs, and other computer manufacturers' equipment will be serviced.

Hardware

The basic device consists of a keyboard control console, memory and central-control unit, and a tape handler. The keyboard (with 34 or 35 characters) can handle the recording of 64 data characters, including the 360 EBCDIC code. The console has a switch that defines the point of operation – indicating whether programs are being entered or verified, data entered or verified, or used for a search operation. (Program entry is the same as making up a program card for a keypunch.) The search is used where an identifier is input and all the records in turn are searched for an identical identifier. A second version has a numeric display that shows an operator what core position is about to be recorded, or, alternatively, the content of that position.

This panel is a special feature of the keytape system – one which Honeywell believes will substantially increase operator efficiency.

The memory consists of up to 120 characters, and can be used to store records read back from the tape so that records can actually be verified by the operator. The keytape also has program patterns, and when tape-to-tape operations are in process a certain amount of tape re-formating can occur under automatic control.

The tape handler is a modified tape unit, using the pneumatic drive which has been standard on Honeywell systems for some time.

Advantages

For data processing managers, a major effect of the system will be to allow the elimination of card input – thereby not holding up the entire computer system. Despite the unblocked files which are naturally produced by the keytapes, the actual speed of data input to the computer is much higher than with cards. Another interesting effect is the reduction of turnover. People who have been using the Mohawk data recorders – which are functionally quite similar to the newly introduced keytape device – have reported surprising reductions in turnover compared to what they were experiencing with key punches. A discussion with Mohawk unit users will probably assist a DP manager in making his evaluations.

One difference between the keytapes and the Mohawk is that on-line operations are possible with the communicator. In the Mohawk system, on-line operations do not normally appear. The keytape does not have any hard copy facilities.

By way of contrast, the Mohawk 1101 can use a buffered off-line printer with a "rated" speed of 300 lines per minute. This unit, the MDS 1320, was introduced in May, 1967, and has been a favorite with users – so much so that Mohawk later acquired the Anelex Corp., manufacturer of the printer, to help safeguard their printer supply.

The tape speed of the Mohawk and Honeywell units also differs, with the newer unit being naturally specified at a higher speed – 24 inches per second by comparison with a maximum of 15 inches per second on the Mohawk line.

The Honeywell Keytape unit, shown above, uses a modified two-reel tape unit with pneumatic drive to control the tape path. The operator is shown mounting a 2400-foot tape reel prior to using the keyboard at right of picture.

New Products

Procedure Manuals — For $2.75

Two new Dial-O-Verter paper tape terminals are available. The Model 5072 combined paper tape transmitter/printer receiver terminal uses a type 202C data set on the dial telephone network and a type 201B or Rixon Sebit 48 data set on leased lines. It can handle all EIA standard 5 through 8-level punched paper tape codes at speeds up to 300 characters per second. The Model 5079 transmit/receive paper tape terminal provides two-way communication for all 5 through 8 paper tapes and is compatible with both the 202C and the 201B data sets. It is capable of transmitting data at rates up to 300 characters per second and receiving at 100 characters per second. The 5072 rents for $750 per month, the 5079 for $300 per month. The terminals are manufactured by *Digitronics Corp.*, Albertson, N.Y.

A computer operator procedure manual called "COP" provides for concise and complete set-up instructions for all computer processing jobs. The manual contains forty removable pages for set-up instructions, a complete computer specification sheet which identifies the units and features of the user's particular computer, and an index to locate all jobs by name and number with their exact location in the book. The manual, useful as a reference book for managers as well as systems analysts and programmers, is available from: *Data Service*, 112 Hillside St., Bennington, Vt. 05201. The cost is $2.75 each for up to five manuals, and $2.50 each for more than five.

New portable field tape transport for physical field recording weighing less than 50 pounds.

A portable digital recorder for field data recording is available from the *Potter Instrument Co.*, Plainview, N.Y. The new Model FT-153 operates directly from a 12 volt battery source and writes and/or reads data in IBM-compatible 7- and 9-channel (IBM 360- or ASCII-compatible) formats, at selectable tape speeds from 15 to 150 ips at packing densities to 800 bpi, NRZI. Data transfer rate is up to 120 kc.

A portable channel simulator designed to connect to IBM 360 I/O interface is available from *Geo-Space Computer Division*, Houston. The self-contained CS-900-A may be used for checking out a wide range of 360-compatible peripherals.

EDPeople

Zakin To Interpret EDP To CPA's

Noel Zakin has been appointed to the newly created post of manager, computer technical services for the *American Institute of Certified Public Accountants*. Zakin has been in the data processing field for some time and has been with Univac where he was Technical Information Center manager. He is well known in the community and is active in association affairs.

Zakin is a graduate of New York University and holds an MBA degree from the Wharton School of the University of Pennsylvania. He is a member of the Association for Computing Machinery.

General Electric has named three new managerial posts at their Electronic Components Sales Operation, Oak Brook, Ill.: **Ott H. Ellenberger,** manager, sales administration; **Richard H. Baumann,** manager, industrial distribution planning; and **John L. Sieber,** manager, consumer distribution planning.

Gerard A. Hirschfield has been named manager of the newly formed Space and Range Systems Department at *System Development Corp.*, Santa Monica, Calif.

The **Diebold Group, Inc.** and its parent company, *John Diebold, Inc.* have announced the election of four officers. Named as vice presidents of the Diebold Group are **Andrew E. Gibson** and **Naomi O. Seligman.** Mrs. Seligman is responsible for the firm's research program. Named as vice president of John Diebold, Inc. is **A. Lawrence Fagan. Liesa Bing** has been appointed secretary and general counsel, John Diebold, Inc. She has worked for the company since 1958, most recently as administrative assistant to John Diebold.

Thomas D. Truitt has been elected vice president of *Applied Logic Corp.*, Princeton, N.J. He joined the firm in 1967 as a vice president.

John D. Temoyan has been named western regional sales manager for the Space and Defense Systems Group of *Control Data Corp.* The company also appointed **Frank A. Creaser** director of marketing for the Group, and **T. O. Meyer,** manager, Army Programs.

Reuben R. McCornack has joined *URS Corp.* as director of personnel for the firm's Information Sciences Division, located in Alexandria, Va.

Raymond W. Ketchledge, executive director of the electronic switching division of *Bell Telephone Laboratories.* delivered the commencement address at the graduation ceremonies of Illinois Institute of Technology on January 26.

Jack Klingel has been promoted to manager of systems and computer integration for general products of the *Goodyear Tire & Rubber Co.* Prior to his appointment, Klingel was a contract administrator and data processing coordinator in the Aviation Products Division.

Charles N. Brewer, former vice president of the First National Bank in Dallas, has joined *Computer Leasing Co.*, Washington, D.C., as vice president and treasurer.

CDC Gets $40,000 Contract

Orders and Installations

The East-West Gateway Coordinating Council of East St. Louis, Ill. has awarded a $40,000 contract to the Data Centers Division of *Control Data Corp.* to design an integrated data flow system for the initial phase of an extensive metropolitan planning program. The contract calls for a method of incorporating hugh volumes of varied statistical information so that processing and analysis will provide a means to investigate the interrelationships between land planning, economic activity, traffic, and population growth in the St. Louis area.

Epsco, Inc. has received a $576,000 contract from the *U.S. Army Missile Command* for airborne receiver assemblies. The assemblies will be manufactured at Epsco's Westwood, Mass. facilities and will be delivered this year.

Support Centers To Be Used For H-110s

The Honeywell 110 system which has just been announced, is marked by slower peripherals than are in use at most computer installations; a more comprehensive installation plan, including user sign off at particularly appropriate points; and an unusually sophisticated software complement for such a low level computer.

The peripherals, including a 300 line per minute printer, an 8.9 kc tape unit, and 400 cards per minute card eaters are joined by a new – and powerful – disk drive. The disk drive is the same style as a 2311, and holds 4.6 million characters per drive. It has the standard average access time of 75 ms, so any program whose throughput is effectually controlled by a disk pack will work as well on the new 110 as on many other systems.

User Signs-Off Each Time A New Application Is Written & Tested

Installation

The installation procedure for the 110 is unusual. On-site engineering control will continue as normal, but the programming support will be given at a central location. Customers will be approached by Honeywell at the outset and arrangements made in writing as to which application should be programmed first; what sources should be allocated to programming and testing the application; and where the work should be done. After the application has come on the air – and been tested in accordance with the data – Honeywell will return to the customer and ask for sign off of satisfaction prior to installation or continuation of work. This work will not be done on-site, but in a center which, depending upon the geographical relationship between the user and the local center, could cause traveling time and expense.

After the first installation application has been programmed, a number of further cycles (including definition, appropriation of the resources, and customer sign off) will continue through the customer's personnel working with management supervision at Honeywell. There is no specific number of cycles that the customer is entitled to, but, in general, it is expected that he will receive this guidance for at least two cycles, and, in some cases, five, six, or even seven. After this, he will be on his own.

Approximately 30 centers are expected to be in operation by the time the first 110s are delivered this summer. The assurance program specifications will not include any guarantee by Honeywell of the timings that will actually obtained in practice, any more than such guarantees are provided by other computer companies.

Cobol-Based Software

The software provided with the 110 is unusually sophisticated, being based on Cobol. Cobol programs are available with any system that has more than 8k of core, contrasting directly with the recently announced requirement of 24k on the 360/25. Cobol is used in two ways – as a programming tool, and as the basis of an operating system. The operating system itself is quite elementary and includes a Cobol programming system. A central data base is used, and programs and data are stored on tape or disk, as the case may be. This data base has room for a library file and for data files as necessary. Maintenance is provided in the standard package and the application library has some specific applications, such as payroll, ledger, etc. The whole Cobol Programming System is part of the standard approach that Honeywell is using with the 110, allowing ease of installation for users who have not previously had systems.

Delivery

Delivery of the 110 begins in August for card and tape systems, in November for disk systems. Technical details are shown in the chart.

Financing support of very small scale systems on-site has been a difficult problem in the past, and some computer manufacturers refuse to introduce systems in this area because of the support needs.

Technical Details Of The Honeywell 110

	Card System	Tape System	Disk System
No. Chars. Core Memory	8,192	8,192	12,288
Cycle Time	4 microsec	4 microsec	4 microsec
Special Features	advanced program and print edit	advanced program and print edit	advanced program and print edit
I/O Channels	1 read/write channel	1 read/write channel	1 read/write channel
Peripherals		3 – 8.9kc magnetic tape units	disk control 2–4.6 million char. random-access disk drives
	300 line/min. printer 400 card/min. card reader/ punch	300 line/min. printer 400 card/min. card reader/ punch	300 line/min. printer 400 card/min. card reader/ punch
Monthly Lease	$1,815	$2,400	$3,320
Purchase Price	$87,300	$116,100	$157,675

Memory	
Capacity	4,096 to 16,384 characters
Access time	2.0 microseconds
Cycle time	4.0 microseconds
Input/Output Trunks	Eight
Read/Write Channels	One or two
Simultaneous Peripheral Operations	Two
Other Standard Features	Automatic I/O and data communications interrupt; card reader, card punch and printer controls are all integrated into the central processor.
Prices	
Lease (per month)	$810 to $1,525
Purchase	$39,600 to $68,625

Saving EDP $s With Your 360/25 Part 4 . . .

Software Is Free - So How CAN You Save Anything?

Earlier in this series we discussed how a data processing manager who is concerned about his budget can save EDP dollars by means of carefully retaining control over the progress of his installation – by using a 360/25 instead of some larger model, and by considering whether or not there are some non-IBM money-saving pieces of hardware. After considering these, there is still another area of cost in EDP installations . . . and where there is cost, good management can effect savings. The area concerned is software.

Saving EDP dollars through software may seem to be a very novel idea. On the surface it is quite absurd. Software costs nothing, it comes free and with it come the manuals, the courses, the advice, etc., etc.

However, this is only half-true. Some software certainly comes free, but an installation looking at its dollar outflow will find that there is quite a lot of money involved due to the presence or absence of software. The performance of the system is directly related to the performance of the software. A fast compiler will reduce the costs of throughput, while a slow compiler will increase them. Equally, any software that causes programmers to make errors has a very direct cost to the installation – appearing in the form of reruns, additional programmer costs, and delays in getting the operation into use.

Lack of software is also costly as there is more programming to be done by the user before the system can be on the air.

Wherever there are costs, there are also potentials for savings. The question is, are any of these potentials available to a user of the 360/25? The answer is, of course, "no." The 360/25 itself is not available! Looking forward to 1969, when it does become available, it is clear that there will be a number of available software systems.

As a user approaches the 360/25, he will find a number of software categories. To start with, there is conversion software. This is the software that helps in moving programs from one system to another. The 360/25 has some excellent hardware compatibility options and, for most users, these will be sufficient. The standard additional software used on the larger 360s to help with this style of conversion is the Compatibility Operating System (COS). This is a Type 2 program, available from IBM but not fully supported. It is often useful for an installation to run under COS rather than using the plain compatibility option. This means that 360-style remote operations and multiprogramming can continue on the system while the 1400 style program is in operation. Unfortunately, COS is not available on the 360/25, as the hardware design makes it impossible to have both the 360 native mode machine code and the compatibility machine code in the machine simultaneously.

As a result, users wanting to use the multiprogramming feature of the 360/25 – and, as one of their programs, run a 1401 program – practically have to convert the 1401 program over to 360 language. IBM does not supply any translations, but there are some on the market. Chart I shows the main types currently available and gives a few details.

C-1 CONVERSION PROGRAMS		
Exodus II	SPS-to-BAL Conversion	Computer Sciences Corporation
Pegasus	SPS-to-BAL Conversion	Management Computer Services
C-2 RUNNING		
ADPAC	Language for Commercial Users	Applied Data Systems
COMPAT-F	Translation between 360 Fortran & 360 Cobol Data Files	Caywood-Schiller Associates
COS	Compatibility Operating System	IBM
PDQ	Quick File Info Retrieval	Applied Data Research
C-3 DEBUGGING		
Autoflow	Automatic Flow-charts from Cobol, Fortran & BAL	Applied Data Research
Quick Draw	Automatic Flow-charts from Cobol, Fortran & BAL	National Computer Analysts
COBOL-AID	Provides Cross Reference Listing for Cobol	Computer Results

After .program conversion, there are other packages you may want to use. IBM supplies a series of application packages you will know about, and there are also some proprietary pieces of software.

The availability of file management and diagnostic aids software is shown on Charts II and III.

For the future, it is clear that software for the 360/25 will become available. There is little in the system that prevents standard 360 software from being used, and standards are available. By the time the 360 is in your computer room there will also be a number of additional uses for software. So, if you are looking to save EDP dollars, you should make sure that you budget money for these items (or for the programming staff). The too-tight budget will restrict potential savings.

This ends the series of *Saving EDP Dollars With Your 360/25.* Obviously, it will have to be updated as time goes on. Further details will appear in COMPUTERWORLD from time to time. If you would like to have a copy of the four articles, together with additional tables and reference material please send your check for $3.00 to:

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$ $ FINANCIAL MATTERS $ $

WASHINGTON, D.C. -- *Computer Leasing Co. (CLC),* Washington equipment leasing and financing corporation, reported 1967 net income of $946,976, equal to $.32 a share, based on 3,002,588 shares outstanding. Revenues for the year amounted to $4,970,793.

During the comparable period last year CLC was a wholly owned subsidiary of University Computing Co., Dallas, and pro forma net income was $301,183, or $.10 a share on revenues of $967,977.

Company assets more than quadrupled during 1967, form $9.7 million to $41.5 million. The value of equipment leased to customers rose from $9.6 million to $28.9 million.

NEW YORK – *Randolph Data Services, Inc.,* a newly formed subsidiary of *Randolph Computer Corp.,* will acquire the assets and business of *United Data Processing Services,* a privately-held computer services center in Cincinnati. Under the terms of the agreement, United Data Processing Services shareholders will receive between 100,000 and 125,000 shares of Randolph Computer Corp. common stock, depending upon future earnings.

NEW YORK – *Programming and Systems, Inc.,* reported a net profit of $185,747 on volume of $1,151,073 for the nine month fiscal period ended November 30, 1967. Earnings per common share (based on 587,888 shares outstanding after a two for one stock split) were equal to $.32 compared with $.22 the year before.

PLAINVIEW, N.Y. -- *Potter Instrument Co., Inc.* reported sales of $8,257,200 for the 24 weeks ended December 16, 1967. This amount represents an increase of 23% over sales of $6,716,000 in the same period in 1966. Earnings for the period were $626,100 or $.27 per share as compared with $624,900, or $.28 per share in the corresponding perlod last year.

MINNEAPOLIS -- *Control Data Corp.* will acquire *Electronic Accounting Card Corp. (EACC),* subject to the approval of EACC's shareholders. The terms of the agreement provide for the tax free exchange of one full share of Control Data's common stock for each 13½ shares of EACC's common stock. Based on 510,000 shares of EACC's common stock outstanding, the agreement calls for the delivery of 37,781 shares of Control Data's common stock. A special meeting of EACC's stockholders will be held on (approximately) May 1, and an affirmative vote of holders of at least two-thirds of EACC stock is required to approve the acquisition. No further action by the baord of directors of either company is required.

RESTON, VA. -- *General Kinetics, Inc.* reported sales and rentals amounting to $1,227,620 for the six months ended November 30, 1967 as compared with $1,514,996 for the like period in 1966. A company spokesman said delivery difficulties and operating expenses combined to produce sharp operating losses. The company's stock is now listed in over-the-counter quotations in New York newspapers.

Computer Stocks: Trading Summary

Week Ending January 26, 1968

NEW YORK STOCK EXCHANGE	1967 High	1967 Low	Week High	Week Low	Last	Week Net Change	Week %Change
Addressograph-Multigraph	80 1/2	46 7/8	77	67 1/8	69 1/4	- 8 1/2	-10.93
American Research	195	37 3/4	168 1/2	157 1/2	161 1/8	- 7 1/8	- 4.23
Ampex Corp.	40 3/4	22 3/4	34 7/8	33 1/4	34 1/8	- 3/4	- 2.15
Burroughs	198 5/8	80 7/8	190 3/4	183	189 3/4	+ 2 1/2	+ 1.33
Collins Radio	114 7/8	53	86 5/8	82 1/2	83	- 1 1/4	- 1.48
Control Data	165 5/8	33 1/2	136 1/4	128 1/8	133 3/8	+ 1 1/8	+ 0.85
Electronic Associates	30 1/4	16 3/4	22 5/8	21 3/8	21 3/8	- 5/8	- 2.84
General Electric	115 7/8	82 1/2	93 1/2	90 5/8	90 7/8	- 2 1/2	- 2.68
Honeywell	117 7/8	63 1/2	96 3/8	92 5/8	92 7/8	- 4 5/8	- 4.74
IBM	648	362 1/2	626	603 1/2	618 1/2	- 2 1/2	- 0.39
Litton	120 3/8	72	92	72	74 7/8	-18	-19.38
Nat Cash Register	136 5/8	67 1/8	118 1/4	111	111	- 7 1/2	- 6.33
RCA	65 1/2	42 5/8	51	49	49 3/4	- 1 1/8	- 2.21
Raytheon	117	49	94	86	90 3/4	+ 1	+ 1.11
Sanders	77 1/4	37 3/8	56 1/2	52	54 3/8	- 1/8	- 0.23
Scientific Data	152 3/4	70 3/8	139	103 1/8	134 3/8	- 1 5/8	- 1.19
SCM	82 1/4	43 1/2	59	53 1/2	55 5/8	- 3 1/4	- 5.52
Sperry Rand	65 1/8	28 1/8	53 7/8	50	52 1/8	- 2 1/8	- 3.92
NYSE COMPUTER STOCK AVERAGE						- 3.17	- 3.61

AMERICAN STOCK EXCHANGE	1967 High	1967 Low	Week High	Week Low	Last	Week Net Change	Week %Change
Audio Devices, Inc.	33 1/8	20	33 1/8	27	29 1/4	- 3 5/8	-11.03
Automatic Data Processing	68 1/2	41 1/2	59 3/4	54 7/8	57 1/4	- 3 1/4	- 5.37
Bunker Ramo	21 7/8	7 1/2	17 3/4	15 7/8	17 1/8	+ 1/2	+ 3.01
Calcomp	46 3/4	34	41 5/8	37 5/8	40 1/2	+ 1/8	+ 0.31
Computer Applications	47 3/8	14	36 1/8	32 1/8	33 3/8	- 4 1/2	-11.88
Computer Sciences	67 5/8	18	52 7/8	47 1/8	49 3/4	- 3 5/8	- 6.79
Digital Equipment Corp.	156	29 3/8	129 1/2	122	127	+ 4 7/8	+ 3.99
GC Computer Corp.	41	23 1/4	30 7/8	28 5/8	29 7/8	- 3/8	- 1.15
Leasco	146 1/4	33 5/8	132 3/4	119	122	-14 1/2	-10.62
Levin-Townsend Computer Corp.	77	10 7/8	65 3/8	60 5/8	62 5/8	- 4 3/4	- 7.05
Milgo Electronics	23 1/8	5 1/8	22 5/8	19 3/8	21 1/2	+ 1/2	+ 2.38
Mohawk Data Sciences	198 1/2	147	160	147 1/2	155	- 5 1/4	- 3.28
Planning Research	51	27 5/8	42 1/4	38 1/4	39 3/8	- 2	- 4.83
Potter Instrument	40 1/2	12 3/8	34	30 1/4	32 1/4	- 1 3/8	- 4.09
Randolph Computer Corp.	55 3/4	32 1/4	53 1/4	48 1/4	51 1/8	- 2	- 3.76
AMEX COMPUTER STOCK AVERAGE						- 2.62	- 4.01

OVER-THE-COUNTER	1967 High Bid	1967 Low Bid	Friday Bid	Friday Asked	Last Friday Bid	Week Net Change Bid	Week % Change Bid
Applied Data Research	30	3 1/8	28	30	28	....	....
Bolt, Beranek & Newman, Inc.	30	8 1/4	21 3/4	22 1/2	22 3/4	- 1	- 4.40
Computer Usage	72	20 1/4	54	56	56	- 2	- 3.57
Cyber-Tronics	19	4 3/4	16 1/2	17 1/4	18 1/2	- 2	-10.81
Data Products	23 3/8	2 1/2	18	18 3/8	18 5/8	- 5/8	- 3.35
Digitronics	27 1/2	6	22	23	20 1/4	+ 1 3/4	+ 8.64
DPA, Inc.	17 3/8	4 1/4	16 1/2	17	17 3/8	- 7/8	- 5.04
Electronic Memories	57 1/2	12 3/4	54	55	57	- 3	- 5.26
Fabri-Tek	13 3/4	6	10 3/4	11 1/4	11 1/2	- 3/4	- 6.52
INC Data, Inc.	18	7 3/8	13 1/2	14	16	- 2 1/2	-15.62
Management Assistance	24 3/8	10 1/8	13 7/8	14 1/4	14 5/8	- 3/4	- 5.13
Memorex	226	63	205	207	201	+ 4	+ 1.99
Optical Scanning Corp.	102	25 3/4	97	100	94	+ 3	+ 3.20
Recognition Equipment Corp.	191	48 1/2	179	184	188	- 9	- 4.79
Systems Engineering Labs	63 1/4	8 7/8	59 1/2	61 1/2	59 1/2	....	....
University Computing Co.	95	72	86	88	86	....	....

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Delivery Fall '69

Model 85 Uses 80 Nsec Buffer

The console of the new 360/85 uses microfiche and CRT displays rather than the standard switches and lights.

WHITE PLAINS, N.Y. – The long-awaited 360/85 has been announced for 1969 delivery. The system has a speed of up to 12.5 million instructions per second, three times faster than the Model 75.

It features a new style console with two microfiche viewers and a cathode ray tube display for maintenance work. The core memory allows for up to 4 million bytes and is overlapped, giving faster access than the cycle time of one usec would indicate. Further speed increases have been added with a 16k buffer storage that has a cycle time of 80 nanoseconds – 12 times faster than the main magnetic core storage. The buffer storage is automatically filled by each request to the memory with a minimum block of 64 bytes, sent from main core to the buffer whenever any request is made.

More details on the 360/85 will be provided in next week's COMPUTERWORLD.

IBM Profits Affected By Increased Leasing

In his letter to stockholders, accompanying the IBM 1967 Annual Report, Chairman Thomas J. Watson mentioned the effect that leasing companies are having on IBM's sales picture. He pointed out that the great majority of IBM equipment users continue to rent directly from IBM, but there has been a substantial increase in the amount of equipment being purchased from IBM by other leasing companies.

Income Figures

Consolidated gross income from worldwide operations amounted to $5,345,290,993, an increase of $1,097,584,902 over 1966. Earnings were $651,499,558, a $125,369,366 increase over the prior year.

Earnings per share were $11.61 based on the 56,114,279 shares outstanding at the end of the year. This compares with earnings of $9.43 per share on the 55,809,405 shares outstanding on December 31,1966, adjusted for the 2½% stock dividend paid June 10, 1967.

Operations outside the United States, included in consolidated results, showed gross income of $1,624,990,742, an increase of $306,891,517 over 1966. Earnings from these operations were $209,360,460, an increase of $34,754,688 over the year before.

Industry Comment

Industry sources say that the turn to leasing companies, mentioned by Watson, is not being welcomed by IBM. One source quoted a current instruction sheet that has been distributed to branch managers: "Leasing companies are henceforth to be treated as competitors of IBM in every sense of the word." This is quite a change, as previously IBM salesmen were the prime information source for many leasing company representatives; often the IBM salesman was an important source of new business leads for the leasing representative.

Third-Party Liability

In addition, IBM has doubled the time for which a salesman's commission is dependent on the continuing use of the computer within the territory. Previously (under the rather complicated compensation structure by which IBM salesmen are paid) the salesman was liable for two years after a computer system was sold to a third-party leasing company. Now this period of liability is four years.

Calendar

CONFERENCES, SYMPOSIA

Feb. 22 - 23, 1968, New Orleans, La. – Assn. of Data Processing Service Organizations Management Conference. Contact: Jerome L. Dreyer, Automatic Data Processing, Inc., 1040 Highway 46, Clifton, N.J. 07013.

Mar. 14 - 16, Houston Tex. – Sixth Annual Symposium on Biomathematics and Computer Science in the Life Sciences. Contact: Office of the Dean, Univ. of Texas, Graduate School of Biomedical Sciences, Division of Continuing Education, P.O. Box 20367, Houston, Texas 77025.

USERS MEETINGS

Mar. 14 - 16, West Lafayette, Ind. – Second Annual Indiana Computer Users Meeting (INCUM). Sponsored by Purdue chapter of ACM. Contact: David G. Fryer, G-161, Math Science Bldg., Purdue University, West Lafayette, Ind. 47907

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